



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/468,489	12/20/1999	HONGYONG ZHANG	1612.63479	3703

7590 03/28/2002

PATRICK G BURNS ESQ
GREER BURNS & CRAIN LTD
SEARS TOWER SUITE 8660
233 S WACKER DRIVE
CHICAGO, IL 60606

EXAMINER

QUACH, TUAN N

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 03/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/468,489

Applicant(s)

ZHANG, HONGYONG

Examiner

Tuan Quach

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 7-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15. 6) ☐ Other: _____

Art Unit: 2814

DETAILED ACTION

Claims 1-6 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In these claims "offset regions" e.g., line 10 has insufficient basis; there is no processing or characterization to show demarcation of such regions. It cannot be determined from the claims how such regions are formed, how they are characterized, which regions correspond to these offset regions.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. or Lee et al. taken with Yudasaka et al.

Hodate et al. show implant to form lightly doped region 55 and further implant to form heavily doped region 57. The gate insulating layer 45 and the gate electrode 46 are also shown. See column 12 lines 59-56. Note additionally that with regard to the newly added features of "offset regions adjacent to", e.g., as inserted in claim 1 line 10 (or claim 22 line 9), such would have been met or otherwise would have been obvious as evidenced in Figs. 4A-4C wherein the differential region depicted as 18 would

Art Unit: 2814

correspond to the offset region and wherein regions 20 would correspond to doped regions at outsides of offset regions as shown in Fig. 4B and 4C, column 7 line 60 to column 8 line 29. Lee et al. also show the lightly doped region 38 outsides of offset region due to the presence of thermal layer 36 thereby creating a corresponding region beyond the channel region, the offset regions are taken to be the regions below the oxide 36 adjacent to the channel below the gate 35. The formation of source drain region 39 is also taught. See Fig. 4D-4G, column 3 lines 4-42. Hodate et al. or Lee et al. lacks anticipation primarily in that it does not clearly show the patterned island shaped semiconductor layers and do not recite the hydrogen ions.

It would have been obvious to one skilled in the art in practicing the Hodate et al. or Lee et al. invention to have employed the various island patterned semiconductors since such corresponds to onventional patterns as shown in Yudasaka et al., Fig. 4, wherein such would permit the formation of adjacent transistors as shown in Fig. 4 and the corresponding description. The alternative of implant through thin gate insulating layer (corresponding to 50 nm or less) or directly would have been an obvious alternative, e.g., as shown in Fig. 8A of Hodate et al., and as such would have been obvious. It would have been obvious to one skilled in the art to have included hydrogen in the implant wherein the implanted ions would permit the formation of low concentration which can be activated at a low temperature thereby permitting such LDD TFT structures on glass substrate and permitting the use of low electrical resistance as delineated in Yudasaka et al., column 38 lines 1-16, column 5 lines 10-25 wherein such inclusion of hydrogen is taught for the lightly doped regions and for the source drain

Art Unit: 2814

regions, column 18 line 50 to column 190 line 18, column 24 line 29 to column 25 line 12, column 27 lines 50 to column 28 line 7, column 29 lines 7-39. Note that the hydrogen is not required to be implanted to the channel region which is masked by the gate thereon and into the implanted regions which correspond to the source/drain and low concentration regions. It would have been within the purview of one skilled in the art to have selected the conventional implant apparatus as in claim 2, the desired energy as in claim 3, given the closely approximate energy in Hodate et al. depending on the projected range desired. The use of hydride as ion source is well known in the art, e.g., Yudasaka et al., column 29 line 18 et seq. and as such would have been obvious.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. or Lee et al. taken with Yudasaka et al as applied to claims 1-4 above, and further in view of Yamazaki et al.

The references as applied above do not recite the laser annealing in these claims.

Yamazaki et al. teach the use of laser annealing for recrystallization, see, eg., column 5 lines 60-64 and for activation, see column 6 lines 24-36.

It would have been obvious to one skilled in the art in practicing the above process to have employed laser annealing to recrystallize and to activate dopants since such corresponds to conventional techniques for such purposes as shown in Yamazaki et al. The damage would be recovered during such activation or alternatively, it would

Art Unit: 2814

have been obvious to one skilled in the art to have obtained recovery of the damage during such annealing.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. or Lee et al. taken with Yudasaka et al. and Yamazaki et al.


Hodate et al, Lee et al., Yudasak et al., and Yamazaki et al. are applied as above. It would have been obvious to one skilled in the art to have employed the island patterned semiconductors for the reasons delineated above and to have employed laser annealing for the reasons delineated above with regard to claims 1 and 5-6, respectively.

Applicant's arguments with respect to claims 1-6 and 21 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number is 703-308-1096. The examiner can normally be reached on M - F from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Tuan Quach
Primary Examiner